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Agriculture

Forest  
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Rob Baracker  
Regional Director  
Bureau of Indian Affairs  
Southwest Regional Office  
P.O. Box 26567  
Albuquerque, NM 87125-6567

Dear Mr. Baracker

In late July, Town of Cochiti Lake Assembly Member Joe Romero contacted our office and asked if we could meet with some of the town officials regarding dying piñons in and around the town. On August 15, 2002, Terry Rogers (entomologist on my staff) and I met with members of the Assembly, as well as Mayor Elizabeth Drummond and Town Administrator Debra Welsh, to discuss concerns about landscape-level piñon mortality. Also in attendance were Andy Quam of the Southern Pueblos Agency and Dave Dutton of the Army Corps of Engineers, Cochiti Lake. Following a question and answer session at the Fire Station, a brief field trip was taken to view conditions on the ground. The extent of the piñon mortality was visually striking. We explained that the bark beetle responsible, the piñon ips (*Ips confusus*), is taking advantage of the drought-weakened condition of the trees. While we described steps homeowners can take to protect high-value trees adjacent to their homes, we emphasized that nothing can be done at the landscape level to prevent this type of drought-driven bark beetle epidemic.

As a follow-up to the meeting, on August 28, 2002, our office conducted a special aerial survey over the area west of Cochiti Lake to quantify the extent of the piñon mortality. Because it would be cost-prohibitive to survey the vast acreage of all piñon-juniper woodland within the state of New Mexico, our annual insect and disease aerial detection flights are largely confined to higher elevation forestland made up of ponderosa pine, mixed conifer, aspen, etc. Therefore, we do not at present have acreage estimates of the total area across New Mexico affected by the piñon ips beetle. However, the special flight of the Cochiti area revealed 15,706 acres of piñon mortality on Cochiti Pueblo land; 18,959 acres on State/County/private land in Sandoval County; 5,425 acres on the Jemez Ranger District of the Santa Fe National Forest; and 2,407 acres on the southern edge of Bandelier National Monument. The total area mapped was about 42,500 acres. On September 16, 2002, our aerial surveyor, Rick Norris, and I conducted a ground survey to characterize stand structure and assess the actual number of trees killed. Within six fixed-radius plots randomly located within the affected area, we recorded species, diameter, and condition (living or dead), of every tree in the plot (no lower-diameter limit). We also cored a few trees to get a general idea of the age of the stand. The results of the ground survey are summarized below:

- Average number of junipers per acre: 245 (no junipers in our plots had died)
- Average number of living piñons per acre: 55 (all survivors were less than 3 inches in diameter)
- Average number of dead piñons per acre: 113
- Percentage of the piñon component that has died: 67%
- Stand composition prior to beetle epidemic: 59% juniper, 41% piñon
- Stand composition now (living trees): 82% juniper, 18% piñon
- Ages of cored trees ranged from 30 to 55 years
- Estimated number of piñons killed: 4 million (adjusted for greater juniper component to the west)



The average pre-epidemic density of the piñon-juniper stand, 413 total trees per acre, seems to be at the upper limit of carrying capacity for the site. The reduced precipitation experienced over the past few years clearly has increased the competition for moisture. The age structure would seem to indicate that some of the piñons now succumbing survived the 1950s drought as seedlings and small saplings. If that is the case, perhaps the young trees now less than 3 inches in diameter will survive this drought and beetle epidemic. According to *Silvics of North America* (USDA FS Agriculture Handbook 654, 1990), piñon does not produce its first cones until about age 25, and does not produce them in quantity until age 75 to 100. If the piñon component of these stands is ever to return to pre-epidemic stocking levels, it will take many years. Those piñons surviving at the time of this site visit appeared to be escaping the bark beetle due to their small size. A tree less than 3 inches in diameter does not supply enough nutrition in the cambium (bark/wood interface) to support ips beetle colonization, and so may not be attacked. Twig beetles (*Pityophthorus* spp. and *Pityogenes* spp.) can kill small-diameter trees, but we saw no evidence of these species in our plots. The seedlings and small saplings we found surviving in the understory are often hidden by the branches of larger trees. This is why it looks to the casual observer as though all the piñons across the landscape have died.



**Landscape view of piñon mortality amid unaffected juniper west of Cochiti Lake, New Mexico, August 15, 2002.**

Should you have any questions about this evaluation, feel free to contact me at (505) 842-3286 or via e-mail at [dallenreid@fs.fed.us](mailto:dallenreid@fs.fed.us).

Sincerely,

/s/ Debra Allen-Reid  
DEBRA ALLEN-REID  
New Mexico Zone Leader,  
Forest Health

cc: Leonard Lucero, Douglas L Parker, Terry J Rogers, David A Conklin, Richard Norris, John Anhold, Thomas Malecek, John F Peterson  
Andy Quam, Southern Pueblos Agency, BIA  
Pueblo of Cochiti Governor  
Debra Welsh, Administrator, Town of Cochiti Lake  
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